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ABSTRACT

This guide to Wisconsin's academic standards for environmental education describes the process and development of state environmental standards. Designed for administrators, school board members, and teachers, the guide explains the purpose and goals of creating standards and contains a brief history of environmental education in Wisconsin. The standards are divided into five sections: (1) Questioning and Analysis; (2) Knowledge of Environmental Processes and Systems; (3) Environmental Issue Investigation Skills; (4) Decision and Action Skills; and (5) Personal and Civic Responsibility. Each section is then subdivided into content standards and performance standards for Grades 4, 8, and 12. Emphasis is placed on interdisciplinary approaches to environmental education, using environmental education as a theme throughout the K-12 curriculum; developing critical thinking, problem solving, decision making, and communication skills; and encouraging responsible citizenry and community skills. A glossary of terms is included. (SJR)

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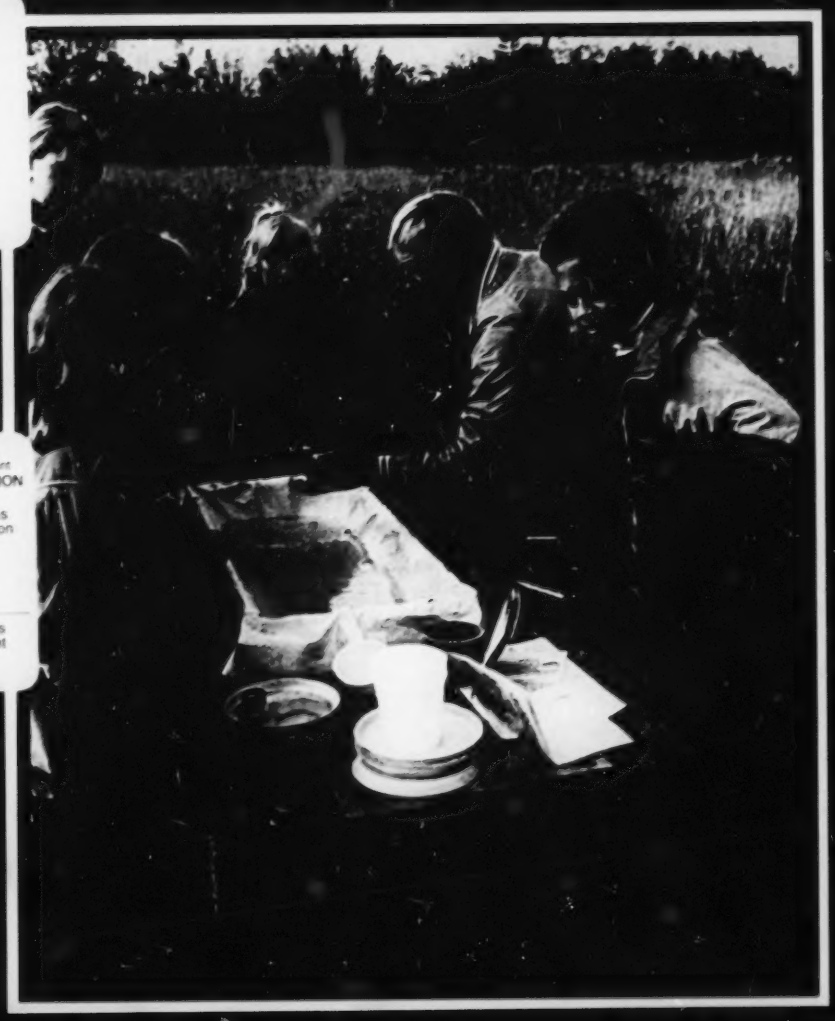

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Wisconsin's Model Academic Standards for Environmental Education

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A Letter From the State Superintendent

To the Citizens of Wisconsin:

Wisconsin has long been a model for other states in terms of education quality. However, the world is rapidly becoming a more complex place. As a result, we must expect greater academic achievement from our children today if they are to be adequately prepared for the challenges of tomorrow.

The only way to ensure that Wisconsin's students have the skills and abilities to be successful in this rapidly changing technological world is to set clear, high academic standards that describe precisely what today's students must learn and be able to do in order to be successful in their adult lives. This is why we focused our efforts over the past two years creating model academic standards in all subject areas. While Wisconsin's Model Academic Standards do demand more of our students, we are confident that our students are equal to the task.

These model academic standards represent the work of a task force made up of people from diverse backgrounds. Educators, parents, and business people produced the academic content and performance standards in this document. Drafts were subjected to public engagement in which many additional people offered input.

It must be stressed that these standards are not intended to limit local districts. Instead they are a model to be met or exceeded. Our hope is that the standards will shape teaching and learning in Wisconsin's more than 2000 school buildings. The standards will define the criteria by which one can judge the quality of education programs. While many schools already have clearly defined high academic standards, many others may wish to review and perhaps change their learning goals and teaching methods.

Standards logically provide the foundation for testing; and, testing results are a critical barometer of both student and teacher success. Local tests that are well-aligned to the standards are a clear indicator of students' preparation for future education, civic responsibility, and meaningful employment.

In closing, I want to commend the members of the task force who gave freely of their time to produce the standards in this document. Finally, the citizens of Wisconsin must be thanked for devoting their time and effort to the development of the final draft of Wisconsin's Model Academic Standards.

John T. Benson

John T. Benson
State Superintendent

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Introduction

Defining the Academic Standards

What are academic standards? Academic standards specify what students should know and be able to do, what they might be asked to do to give evidence of standards, and how well they must perform. They include content, performance, and proficiency standards.

— Content standards refer to *what* students should know and be able to do.

— Performance standards tell *how* students will show that they are meeting a standard.

— Proficiency standards indicate *how well* students must perform.

Why are academic standards necessary? Standards serve as rigorous goals for teaching and learning. Setting high standards enables students, parents, educators, and citizens to know what students should have learned at a given point in time. The absence of standards has consequences similar to lack of goals in any pursuit. Without clear goals, students may be unmotivated and confused.

Contemporary society is placing immense academic demands on students. Clear statements about what students must know and be able to do are essential to ensure that our schools offer students the opportunity to acquire the knowledge and skills necessary for success.

Why are state-level academic standards important? Public education is a state responsibility. The state superintendent and legislature must ensure that all children have equal access to high quality education programs. At a minimum, this requires clear statements of what all children in the state should know and be able to do as well as evidence that students are meeting these expectations. Furthermore, academic standards form a sound basis on which to establish the content of a statewide assessment system.

Why does Wisconsin need its own academic standards? Historically, the citizens of Wisconsin are very serious and thoughtful about education. They expect and receive very high performance from their schools. While educational needs may be similar among states, values differ. Standards should reflect the collective values of the citizens and be tailored to prepare young people for economic opportunities that exist in Wisconsin, the nation, and the world.

Developing the Academic Standards

Who wrote the academic standards and what resources were used? Academic standards for the non-state-assessed subjects were drafted by task forces appointed by the state superintendent. The task forces consisted of educators, parents, board of education members, and business and industry people. After reviewing national standards in the subject area, standards from other states, and standards from local Wisconsin school districts, each task force diligently and thoughtfully composed the academic standards for its respective subject.

How was the public involved in the standards process? Public input is crucial to the success of implementing high-quality standards. It was absolutely essential that the final academic standards reflect the values of Wisconsin's citizens.

Forums, focus groups, and input on the discussion drafts of the academic standards were used for getting citizens' ideas. Drafts of the standards were widely available throughout the state—including the DPI home page available on the Internet. All input received serious consideration.

Using the Academic Standards

Must a district adopt Wisconsin's Model Academic Standards? Adopting Wisconsin's Model Academic Standards is voluntary, not mandatory. By law, however, districts must have academic standards in place by August 1, 1998, in reading and writing, geography and history, mathematics, and science. Districts may adopt the model state standards, or standards from other sources, or develop their own standards. Although not required by law to have standards in the other subjects, districts may choose to adopt or develop academic standards in those areas as well.

How will local districts use the academic standards? Districts may use the academic standards as guides for developing local grade-by-grade curriculum. Implementing standards may require some school districts to upgrade school and district curriculums. In some cases, this may result in significant changes in instructional methods and materials, local assessments, and professional development opportunities for the teaching and administrative staff.

Do academic standards in the vocational areas mean that districts need to offer electives in these subjects at the elementary and middle school levels? Most subjects are developmental—they build upon previously learned knowledge and skills. In addition, subjects include knowledge and skills that are of great value to all students regardless of their future life and career plans.

The model academic content and performance standards developed for the vocational areas include subject matter that all students should learn. In many cases, students are already learning these in elementary and middle school. The academic standards for vocational areas are a means to assist teachers in knowing if they are meeting the needs of students by preparing them for future opportunities.

With the academic standards in vocational areas at the fourth and eighth grade levels, it is not expected new elective courses will need to be instituted. Current middle and high school vocational teachers are encouraged to work with elementary and middle school teachers from other subject areas to connect curriculum experiences.

Why do some of the subjects also benchmark for "emphasis students" as well as for grades 4, 8, and 12? Most subjects include knowledge and skills that are of great value to all students. Identified knowledge and skills should be part of the performance standards for all students. In addition, some vocational subjects include more in-depth knowledge and skills that are necessary for specific applications. Students should be able to pursue courses requiring in-depth knowledge and skills that are consistent with their life and career plans. The standards directed at "emphasis students" address a much higher level of performance in that subject.

How do DPI skill standards fit with the academic standards currently being developed? Academic content, performance, and proficiency standards focus on expectations about what all students should know and be able to do, how they will show that they have met the standards, and at what level or quality of performance.

Skill standards include content from multiple disciplines and define what productive workers in an occupational cluster or industry sector need to know and be able to do.

What is the difference between academic standards and curriculum? Standards are statements about what students should know and be able to do, what they might be asked to do to give evidence of learning, and how well they should be expected to know or do it. Curriculum is the program devised by local school districts used to prepare students to meet standards. It consists of activities and lessons at each grade level, instructional materials, and various instructional techniques. In short, standards define what is to be learned at certain points in time, and from a broad perspective, what performances will be accepted as evidence that the learning has occurred. Curriculum specifies the details of the day-to-day schooling at the local level.

What is the link between statewide academic standards and statewide testing? Statewide academic standards in mathematics, English language arts, science, and social studies determine the scope of state-

wide testing. While these standards are much broader in content than any single Wisconsin Student Assessment System (WSAS) test, they do describe the range of knowledge and skills that may appear on the tests. If content does not appear in the academic standards, it will not be part of a WSAS test. The statewide standards clarify what must be studied to prepare for WSAS tests. If students have learned all of the material indicated by the standards in the assessed content areas, they should do very well on the state tests.

Relating the Academic Standards to All Students

Parents and educators of students with disabilities, with limited English proficiency (LEP), and with accelerated needs may ask why academic standards are important for their students. Academic standards serve as a valuable basis for establishing meaningful goals as part of each student's developmental progress and demonstration of proficiency. The clarity of academic standards provides meaningful, concrete goals for the achievement of students with disabilities, LEP, and accelerated needs consistent with all other students.

Academic standards may serve as the foundation for individualized programming decisions for students with disabilities, LEP, and accelerated needs. While the vast majority of students with disabilities and LEP should be expected to work toward and achieve these standards, accommodations and modifications to help these students reach the achievement goals will need to be individually identified and implemented. For students with disabilities, these decisions are made as part of their individualized education program (IEP) plans. Accelerated students may achieve well beyond the academic standards and move into advanced grade levels or into advanced coursework.

Clearly, these academic standards are for all students. As our state assessments are aligned with these standards and school districts adopt, adapt, or develop their own standards and multiple measures for determining proficiencies of students, greater accountability for the progress of all students can be assured. In Wisconsin this means all students reaching their full individual potential, every school being accountable, every parent a welcomed partner, every community supportive, and no excuses.

Applying the Academic Standards Across the Curriculum

When community members and employers consider what they want citizens and employees to know and be able to do, they often speak of broad areas of applied knowledge such as communication, thinking, problem-solving, and decision-making. These areas connect or go beyond the mastery of individual subject areas. As students apply their knowledge both within and across the various curricular areas, they develop the concepts and complex thinking of educated persons.

Community members need these skills to function as responsible citizens. Employers prize those employees who demonstrate these skills because they are people who can continue learning and connect what they have learned to the requirements of a job. College and university faculty recognize the need for these skills as the means of developing the level of understanding that separates the expert from the beginner.

Teachers in every class should expect and encourage the development of these shared applications, both to promote the learning of the subject content and to extend learning across the curriculum. These applications fall into five general categories:

1) **Application of the Basics**

2) **Ability to Think**
   - — Problem-solving
   - — Informed decision-making
   - — Systems thinking
   - — Critical, creative, and analytical thinking
   - — Imagining places, times, and situations different from one's own
   - — Developing and testing a hypothesis
   - — Transferring learning to new situations

3) **Skill in Communication**
   - — Constructing and defending an argument
   - — Working effectively in groups
   - — Communicating plans and processes for reaching goals
   - — Receiving and acting on instructions, plans, and models
   - — Communicating with a variety of tools and skills

4) **Production of Quality Work**
   - — Acquiring and using information
   - — Creating quality products and performances
   - — Revising products and performances
   - — Developing and pursuing positive goals

5) **Connections with Community**
   - — Recognizing and acting on responsibilities as a citizen
   - — Preparing for work and lifelong learning
   - — Contributing to the aesthetic and cultural life of the community
   - — Seeing oneself and one's community within the state, nation, and world
   - — Contributing and adapting to scientific and technological change

Overview of Environmental Education

The Wisconsin Environmental Education Board (WEEB) defines environmental education as "a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, ethical awareness and sensitivity for the relationship between humans and the environment, and commitment to engage in responsible individual and cooperative actions. By these actions, environmentally literate citizens will help ensure an ecologically and economically sustainable environment."

Wisconsin's historical commitment to environmental education is well-known. Beginning in the 1930s, Wisconsin citizens recognized the need for environmental education to be an integral part of a young person's schooling. By requiring instruction in the conservation of natural resources at both the elementary and secondary levels as well as in the teacher preparation programs, the groundwork was laid for an environmentally conscious and responsible citizenry.

Since 1983, the people of Wisconsin, through their elected officials, have achieved important environmental education goals, including:

- establishing a requirement that every school district develop and implement a written, sequential curriculum plan incorporating instruction in environmental education into all subject area curriculum plans, with the greatest emphasis in plans for art, health, science, and social studies education [see Wisconsin Administrative Code PI 8.01(2)(k)].

Because environmental education is interdisciplinary, previous efforts to define discipline-centered content standards have not fully captured its essence. Content and performance standards for each of the disciplines have environmental content, yet there is no umbrella document that describes the integration of these disciplinary standards to create curricula that will produce environmentally literate citizens. References have been made throughout this document to the content and performance standards for other disciplines in order to assist with the interdisciplinary approach to environmental education.

Many Wisconsin schools integrate environmental examples into some of their coursework, thereby fostering enthusiasm for science and other disciplines. Infusing environmental education throughout the K-12 curriculum increases classroom learning. Environmental education provides a vehicle for engendering responsible citizenship, utilizing a variety of instructional models and guidelines that have been long accepted in the field of education.

Although content and performance standards outline the core ingredients for quality environmental education, they do not prescribe how environmental education will be taught at the local level. Educators, community members, and parents will continue to develop appropriate curricula using the standards as guidelines against which they can monitor the quality of their children's environmental education experiences.

In the text that follows, terms with an asterisk (*) are defined and/or exemplified in the Glossary of Terms following the standards.

A. QUESTIONING AND ANALYSIS

CONTENT STANDARD

Students in Wisconsin will use credible research methods to investigate environmental questions, revise their personal understanding to accommodate new knowledge and perspectives, and be able to communicate this understanding to others.

Rationale: Developing an understanding of the environment and environmental sustainability depends on students' willingness and ability to ask questions about the world around them, speculate and hypothesize, seek information, and develop answers to their questions. Environmental literacy requires a familiarity with some basic modes of inquiry; a mastery of fundamental skills for gathering, organizing, interpreting, synthesizing, and evaluating information; developing explanations; and communicating these understandings to others.

PERFORMANCE STANDARDS

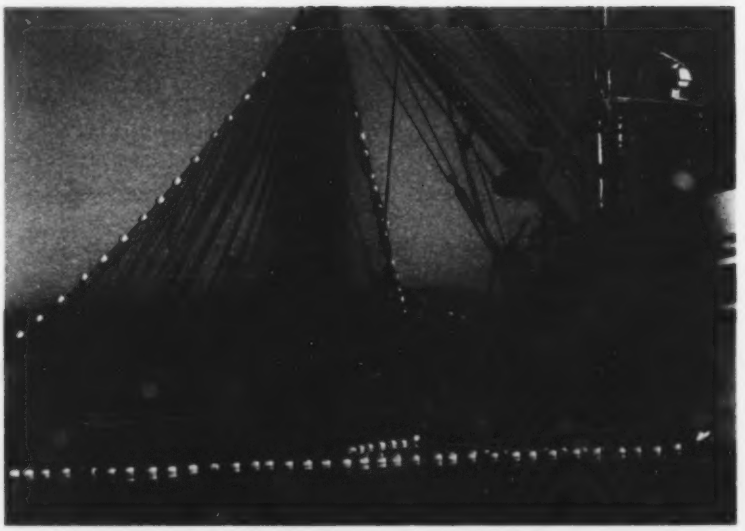
▶ *BY THE END OF GRADE 4 STUDENTS WILL:*

A.4.1 Make observations, ask questions and plan environmental investigations* (*see Science [SC] Inquiry; English/Language Arts [LA] Research*)

A.4.2 Collect information, make predictions, and offer explanations about questions asked (*see: SC Inquiry*)

A.4.3 Develop answers, draw conclusions, and revise their personal understanding as needed based on their investigations* (*see SC Inquiry*)

A.4.4 Communicate their understanding to others in simple terms (*see LA Writing*)



*Terms with an asterisk are defined in the Glossary of Terms.

BY THE END OF GRADE 8 STUDENTS WILL:

A.8.1 Identify environmental issue* questions that can be investigated using resources and equipment available (*see SC Inquiry; LA Research*)

A.8.2 Collect information from a variety of resources, conduct experiments, and develop possible solutions to their investigations*

A.8.3 Use techniques such as modeling and simulating to organize information gathered in their investigations* (*see Mathematics [MA] Process*)

A.8.4 Use critical-thinking strategies to interpret and analyze gathered information (*see SC Inquiry*)

A.8.5 Use the results of their investigations* to develop answers, draw conclusions, and revise their personal understanding

A.8.6 Communicate the results of investigations* by using a variety of media and logically defend their answers (*see LA Writing; Math [MA] Process*)

BY THE END OF GRADE 12 STUDENTS WILL:

A.12.1 Identify questions that require skilled investigation* to solve current problems* cited in literature, media, or observed through personal observations (*see LA Research*)

A.12.2 Suggest possible investigations* and describe the results that might emerge from the investigations* (*see SC Inquiry*)

A.12.3 Evaluate personal investigations* and those of others, critiquing procedures, results, and sources of data and suggest improvements to the investigation* (*see LA Research; MA Process*)

A.12.4 State and interpret their results accurately and consider other explanations for their results (*see LA Writing*)

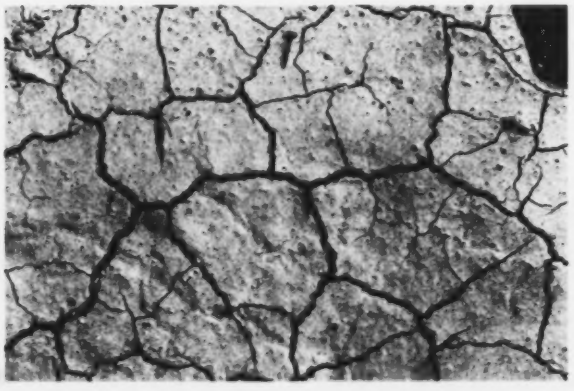
A.12.5 Communicate the results of their investigations* to groups concerned with the issue* (*see LA Oral Language*)

B. KNOWLEDGE OF ENVIRONMENTAL PROCESSES AND SYSTEMS

CONTENT STANDARD

Students in Wisconsin will demonstrate an understanding of the natural environment and the interrelationships among natural systems.

Rationale: The foundation of environmental education is a basic understanding of the processes of the interacting systems that comprise the environment. Therefore, it is essential that students have knowledge of the earth as a dynamic, physical, and living system that has been affected over time by various human societies. This knowledge is a necessary prerequisite for problem-solving activities required for individual and community response to environmental issues.



PERFORMANCE STANDARDS

▶ *BY THE END OF GRADE 4 STUDENTS WILL:*

Energy and Ecosystems

B.4.1 Describe the flow of energy* in natural systems, citing the sun as the source of energy* on the earth; e.g., a food chain (*see SC Physical Science*)

B.4.2 Illustrate how they use energy* in their daily lives

B.4.3 List sources of energy,* distinguishing between renewable* and nonrenewable* sources

B.4.4 List the components of an ecosystem,* including the qualities of a healthy habitat* (*see SC Life and Environmental Science*)

B.4.5 Describe natural and human-built ecosystems* in Wisconsin

B.4.6 Cite examples of how different organisms adapt to their habitat*

B.4.7 Draw a simple hydrologic cycle*

Natural Resources and Environmental Quality

B.4.8 Describe and give examples of natural resources;* e.g., water, minerals, soils, air (*see SC Nature of Science*)

B.4.9 Distinguish between renewable* and nonrenewable* resources

B.4.10 Describe how they use natural resources* in their daily lives

B.4.11 List jobs in the community that result from or are influenced by processing and using natural resources*

B.4.12 Determine the cause of different types of pollution*

*Terms with an asterisk are defined in the Glossary of Terms.

BY THE END OF GRADE 8 STUDENTS WILL:

Energy and Ecosystems

B.8.1 Describe the flow of energy* in a natural and a human-built ecosystem* using the laws of thermodynamics (*see SC Physical Science*)

B.8.2 Explain how change is a natural process, citing examples of succession,* evolution,* and extinction

B.8.3 Explain the importance of biodiversity*

B.8.4 Map the levels of organization of matter; e.g., subatomic particles through biomes (*see SC Physical Science*)

B.8.5 Give examples of human impact on various ecosystems*

B.8.6 Describe major ecosystems* of Wisconsin (*see SC Life and Environmental Science*)

B.8.7 Illustrate the conservation of matter using biogeochemical cycles; e.g., carbon, nitrogen, phosphorous

B.8.8 Explain interactions among organisms or populations of organisms

B.8.9 Explain how the environment is perceived differently by various cultures* (*see SC Nature of Science*)

B.8.10 Explain and cite examples of how humans shape the environment

B.8.11 Describe our society* as an ecosystem*

Natural Resources and Environmental Quality

B.8.12 Provide examples of how different cultures* use natural resources reflecting the economic, aesthetic, and other values* of that culture

B.8.13 Diagram how resources are distributed around the world (*see SC Nature of Science; Social Studies [SS] Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

B.8.14 Identify the natural resources* that are found in Wisconsin and those that are imported

B.8.15 Analyze how people impact their environment through resource use

B.8.16 Recognize the economic, environmental, and other factors that impact resource availability and explain why certain resources are becoming depleted

B.8.17 Explain how human resource use can impact the environment; e.g., erosion, burning fossil fuels

B.8.18 Identify major air, water, or land pollutants and their sources

B.8.19 Distinguish between point* and nonpoint source* pollution*

B.8.20 Identify types of waste* and methods for waste* reduction (*see SC Earth and Space Science*)

B.8.21 Identify and analyze individual, local, regional, national, and global effects of pollution* on plant, animal, and human health

B.8.22 Identify careers related to natural resources* and environmental concerns (*see SC Applications*)

B.8.23 Identify governmental and private agencies responsible for environmental protection and natural resource* management

B.8.24 Create a timeline of Wisconsin history in resource management (*see SC Nature of Science*)

BY THE END OF GRADE 12 STUDENTS WILL:

Energy and Ecosystems

B.12.1 Evaluate the relationship of matter and energy* and the flow of energy* in natural, managed, and built systems (*see SC Physical Science*)

B.12.2 Describe the value of ecosystems* from a natural and human perspective; e.g., food, shelter, flood control, water purification

B.12.3 Evaluate the stability and sustainability* of ecosystems* in response to changes* in environmental conditions (*see SC Life and Environmental Science*)

B.12.4 Analyze the factors that determine the number of organisms that can exist in a given area

B.12.5 Analyze past and current trends in ecosystem* degradation and species extinction (*see SC Earth and Space Science*)

B.12.6 Predict population response to changes* in environmental conditions

B.12.7 Evaluate the importance of biodiversity*

B.12.8 Relate the impact of human activities in ecosystems* to the natural process of change, citing examples of succession,* evolution,* and extinction (*see SC Earth and Space Science*)

B.12.9 Evaluate ways in which technology has expanded our ability to alter the environment and its capacity to support humans and other living organisms

Natural Resources and Environmental Quality

B.12.10 Identify and evaluate multiple uses of natural resources* and how society* is influenced by the availability of these resources

B.12.11 Assess how changes in the availability and use of natural resources* (especially water and energy* sources) will affect society and human activities; such as, transportation, agricultural systems, manufacturing

B.12.12 Evaluate the environmental and societal costs and benefits of allocating resources in various ways and identify management strategies to maintain economic and environmental sustainability* (*see SC Earth and Space Science*)

B.12.13 Analyze how different political and governmental systems manage resource development, distribution, consumption, and waste* disposal (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

B.12.14 Investigate how technological development has influenced human relationships and understanding of the environment

B.12.15 Describe changes* in the rates of human population growth in various societies and the factors associated with those changes* related to economic and environmental sustainability*

B.12.16 Analyze how natural resource* ownership and trade influences relationships in local, national, and global economies (*see SS The Behavioral Sciences: Individuals, Institutions, and Society*)

B.12.17 Explain the concept of exported/imported pollution;* e.g., smokestacks, watersheds, and weather systems

B.12.18 Analyze cause and effect relationships of pollutants and other environmental changes* on human health

B.12.19 Illustrate how environmental quality affects the economic well-being of a community

B.12.20 Debate the risks of producing pollutants

B.12.21 Research the roles of various careers related to natural resource* management and other environmental fields (*see SC Applications*)

B.12.22 Research individuals who have made important contributions to the field of resource management (*see SC Nature of Science*)

Terms with an asterisk (*) are defined in the Glossary of Terms.

C. ENVIRONMENTAL ISSUE INVESTIGATION SKILLS

CONTENT STANDARD

Students in Wisconsin will be able to identify, investigate, and evaluate environmental problems and issues.

Rationale: Solving environmental problems and issues requires skills in environmental investigations. These skills, in turn, provide students with opportunities to apply and improve their capacity for systems thinking and their understanding of a sustainable world and society. Focusing on environmental issues offers students a means of integrating their knowledge of human and environmental systems and a way of finding personal relevance in that knowledge.

PERFORMANCE STANDARDS

▶ *BY THE END OF GRADE 4 STUDENTS WILL:*

C.4.1 Identify environmental problems and issues (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

C.4.2 Apply ideas of past, present, and future to specific environmental issues (*see SC Connections*)

C.4.3 Identify people and groups of people that are involved in the issue

C.4.4 Identify some of the decisions and actions related to the issue

C.4.5 Identify proposed solutions to the issue and discuss arguments for and against the issue

*Terms with an asterisk are defined in the Glossary of Terms.

BY THE END OF GRADE 8 STUDENTS WILL:

C.8.1 Define and provide examples of environmental issues,* explaining the role of beliefs,* attitudes, and values* (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

C.8.2 Use environmental monitoring techniques; such as, observations, chemical analysis, and computer mapping software to collect data about environmental problems* (*see LA Media and Technology; MA Measurement*)

C.8.3 Use questioning and analysis skills to determine beliefs, attitudes, and values held by people involved in an environmental issue

C.8.4 Evaluate the credibility of information, recognizing social, economic, political, environmental, technological, and educational influences (*see LA Writing*)

BY THE END OF GRADE 12 STUDENTS WILL:

C.12.1 Compare the effects of natural and human-caused activities that either contribute to or challenge an ecologically and economically sustainable* environment (*see SC Nature of Science*)

C.12.2 Explain the factors that contribute to the development of individual and societal values* (*see SS The Behavioral Sciences: Individuals, Institutions, and Society*)

C.12.3 Maintain a historical perspective when researching environmental issues;* include past, present, and future considerations (*see SC Connections*)

C.12.4 Identify the strengths and weaknesses of different approaches to investigating an environmental issue* and identify some of the assumptions for each approach

D. DECISION AND ACTION SKILLS

CONTENT STANDARD

Students in Wisconsin will use findings from environmental issue investigations to develop decision-making skills, and to gain experience in citizen action skills.

Rationale: Students need decision-making and action skills to contribute toward environmental sustainability. In addition, these skills enable them to analyze the effectiveness of individual versus group action, develop issue-resolution plans that incorporate one or more citizen participation skills, and consider these plans in terms of social, cultural, and ecological consequences and implications.

PERFORMANCE STANDARDS

▶ *BY THE END OF GRADE 4 STUDENTS WILL:*

D.4.1 Demonstrate knowledge of a decision-making process that includes selecting and using data, suggesting possible alternatives, predicting consequences, and being aware of available resources (*see SC Inquiry; LA Inquiry*)

D.4.2 Identify and give examples of short-term and long-term solutions to a problem*

D.4.3 Identify two or more ways to take positive environmental action; e.g., posters, letters, and speeches (*see LA Oral Language*)

D.4.4 Communicate with local, state, or national officials regarding an environmental topic (*see LA Writing*)

D.4.5 Explain how they can influence an environmental issue

D.4.6 Develop a plan, either individually or in a group, to preserve the local environment

*Terms with an asterisk are defined in the Glossary of Terms.

BY THE END OF GRADE 8 STUDENTS WILL:

D.8.1 Identify options for addressing an environmental issue* and evaluate the consequences of each option

D.8.2 List the advantages and disadvantages of short-term and long-term solutions to an environmental issue* or problem*

D.8.3 List reasons why an individual or group chooses to participate or not participate in an environmental activity in the home, school, or community

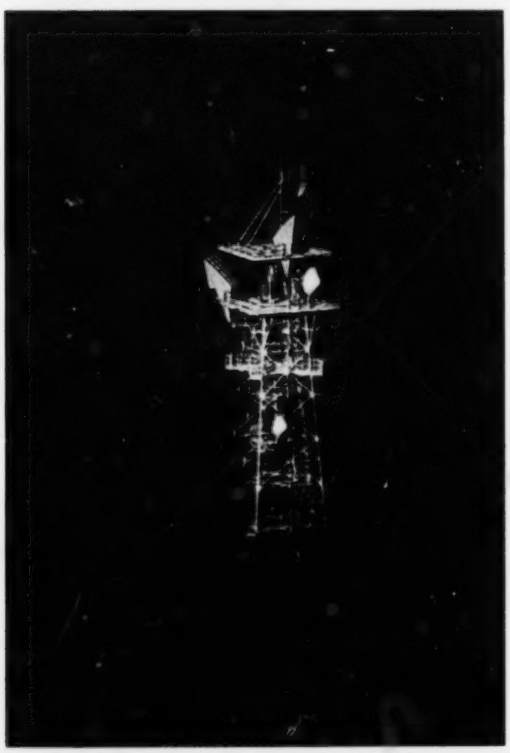
D.8.4 Explain the political, legal, and budgetary options for resolving local, state, and national environmental issues* (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

D.8.5 Explain how personal actions can impact an environmental issue;* e.g., doing volunteer work in conservation

D.8.6 Develop a plan for improving or maintaining some part of the local environment and identify their role in accomplishing this plan

D.8.7 Identify examples of how personal beliefs* can influence environmental decisions

D.8.8 Give examples of education, economic, and government institutions' influence on an environmental issue,* and the role of citizens* in policy formation (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)



BY THE END OF GRADE 12 STUDENTS WILL:

D.12.1 Identify a variety of approaches to environmental issues,* evaluate the consequences of each, and select and defend a position

D.12.2 Evaluate reasons for participation or nonparticipation in an environmental activity in the home, school, or community

D.12.3 Describe the range of political and legal options available to resolve an environmental problem;* state for each the costs, benefits, and limitations of effectiveness in practice; and select and defend the best option (*see SS Economics: Production, Distribution, Exchange, Consumption*)

D.12.4 Describe the rights and responsibilities of citizenship in regard to environmental problems* and issues* (*see LA Oral Language*)

D.12.5 Develop a plan to maintain or improve some part of the local or regional environment, and enlist support for the implementation of that plan (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility; SC Nature of Science*)

D.12.6 Identify and analyze examples of the impact beliefs* and values* have on environmental decisions

D.12.7 Analyze political, educational, economic, and governmental influences on environmental issues,* and identify the role of citizens* in policy formation (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

D.12.8 Use cost-benefit analysis to evaluate proposals to improve environmental quality

D.12.9 Describe the regulatory and economic approaches to improving the environment and explain the advantages and disadvantages of each

E. PERSONAL AND CIVIC RESPONSIBILITY

CONTENT STANDARD

Students in Wisconsin will develop an understanding and commitment to environmental stewardship.

Rationale: Environmentally literate students recognize how their individual behaviors affect the environment. They have the knowledge, skills, and confidence to act on their own about what should be done to maintain an economically and ecologically sustainable environment. They will recognize that their participation in activities can lead to resolution of environmental challenges.

PERFORMANCE STANDARDS

▶ *BY THE END OF GRADE 4 STUDENTS WILL:*

E.4.1 **Identify and describe examples of their environmental civic responsibilities and the actions they take to meet them**

E.4.2 **Understand how their personal actions impact their civic responsibilities toward the environment** (*see SS Political Science and Citizenship: Power, Authority, Governance, and Responsibility*)

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**Terms with an asterisk are defined in the Glossary of Terms.*

BY THE END OF GRADE 8 STUDENTS WILL:

E.8.1 Formulate a personal plan for environmental stewardship*

E.8.2 Explain the importance of characteristics (such as, trust, patience, self-discipline, respect, and open-mindedness) that enable people to function together to resolve environmental issues*

BY THE END OF GRADE 12 STUDENTS WILL:

E.12.1 Articulate their personal beliefs* regarding their relationship to the environment (*see LA Oral Language*)

E.12.2 Write a plan of action based on personal goals of stewardship* for an economically and ecologically sustainable* environment

E.12.3 Take action in regard to environmental issues* in the home, school, or communities

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Glossary of Terms

Audience Appropriate. Materials, ideas, language, etc., being used or presented at a level of understanding.

Belief. Something accepted as true.

Citizen. A person entitled by birth or naturalization to the protection of a given state.

Culture. The totality of socially transmitted behavior patterns, arts, beliefs, institutions, and all other products of human work and thought characteristic of a community or population.

Diversity. Physical or biological complexity of a system. Usually a measure of the number of different species in an ecosystem. (Miller)*

Ecosystems. Self-regulating natural community of plants and animals interacting with one another and with their nonliving environment. (Miller)*

Energy. Ability to do work or produce a change by pushing or pulling some form of matter or to cause a heat transfer between two objects at different temperatures. (Miller)*

Ethic. A principle of right or good conduct; the moral quality of a course of action.

Evolution. The process by which a population of a species changes its characteristics over time in response to changes in environmental conditions. (Miller)*

Habitat. The area or type of environment in which an organism or biological population normally lives or occurs.

Hydrologic Cycle. Biogeochemical cycle that moves and recycles water in various forms through the biosphere. (Miller)*

Inquiry. A close examination of some matter in a quest for information or truth.

Investigation. A process of systematic inquiry.

Issue. A point of discussion, debate, or dispute.

Monitor. To scrutinize or check systematically with a view to collecting certain specified categories of data.

Natural Resource. Anything obtained from the physical environment to meet human needs. (Miller)*

Nonpoint Source. Source of pollution in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control. (Miller)*

Nonrenewable. Resource that exists in a fixed amount (stock) in various places in the earth's crust and has the potential for renewal only by geological, physical, and chemical processes taking place over hundreds of millions to billions of years. (Miller)*

Point Source. Source of pollution that involves discharge of pollutants from an identifiable point such as a smokestack or sewage treatment plant. (Miller)*

Pollution. A change in the physical, chemical, or biological characteristics of the air, water, or soil that can affect the health, survival, or activities of human beings or other living organisms in a harmful way. (Miller)*

Problem. A question or situation that presents uncertainty, perplexity, or difficulty.

Renewable. Resource that theoretically can last indefinitely without reducing the available supply, either because it is replaced more rapidly through natural processes than are nonrenewable resources or because it is essentially inexhaustible. (Miller)*

Society. A group of human beings broadly distinguished from other groups by mutual interests, participation in characteristic relationships, shared institutions, and a common culture.

Succession. Process in which communities of plant and animal species are replaced in a particular area over time by a series of different and usually more complex communities. (Miller)*

Sustainability. Ability of a system to survive for some specified (finite) time.

Stewardship. The concept of responsible caretaking, based upon the premise that we do not own resources but are managers of resources, and are responsible to future generations for their condition.

Value. A principle, standard, or quality considered worthwhile or desirable.

Waste. Useless, unneeded, discarded, unused or excess material such as ashes, garbage, by-products.

**Environmental Science: Working with the Earth*. 7th edition. G. Tyler Miller, Jr. Wadsworth Publishing Co. c1999.

Notes